Shigellosis
Table of Contents

Shigellosis

Overview[1,2]

For a complete description of shigellosis, refer to the following texts:

- Control of Communicable Diseases Manual (CCDM).
- Red Book, Report of the Committee on Infectious Diseases.

Case Definition[3]

Clinical description
An illness of variable severity characterized by diarrhea, fever, nausea, cramps, and tenesmus (ineffectual and painful straining at stool). Asymptomatic infections may occur.

Laboratory Criteria for Diagnosis:
Isolation of *Shigella* from a clinical specimen.

Case Classification:
Confirmed: a case that is laboratory confirmed.
Probable: a clinically compatible case that is epidemiologically linked to a confirmed case.

Comment: *Shigella dysentariae*, while rare in Missouri, is an extremely serious illness with case-fatality rates that may go as high as 20% despite hospitalized treatment. If a case of *Shigella dysentariae*, is reported, **contact the Regional Communicable Disease Coordinator immediately.**

Information Needed for Investigation

- **Verify the diagnosis**. What laboratory tests were conducted and what were the results?
- **When investigating gastrointestinal illness of unknown etiology,** see the "Outbreaks of Acute Gastroenteritis" Section.
- **Establish the extent of illness**. Determine if household or other close contacts are, or have been ill, by contacting the health care provider, patient or family member.
- **Contact the Regional Communicable Disease Coordinator,** if an outbreak is suspected, or if cases are in high-risk settings or jobs such as food handlers, child care, or health care.
- **Contact the Bureau of Child Care,** if cases are associated with a child care facility.

Case/Contact Follow Up And Control Measures

Determine the source of infection to prevent other cases:

- Does the case or a member of the case's household attend a child care center or nursery school?
- Does the case or a member of the case's household work as a foodhandler or healthcare provider?
- Identify symptomatic household and other close contacts and obtain stool specimens.
- Has the case traveled to an area where shigellosis is known to be endemic or where there is a known outbreak occurring?
- Have there been other cases linked by time, place or person?
- Does the case engage in sexual or other practices that would put them or others at increased risk?

Control Measures

See the Shigellosis section of the Control of Communicable Diseases Manual (CCDM), "Control of patient, contacts, and the immediate environment".

See the *Shigella* Infections section of the Red Book.

General:

- The single most important control measure is proper handwashing.
- *Shigella sp.* are frequently resistant to antibiotics. Antibiotic sensitivity, while not performed by the State Public Health Laboratory (SPHL), is routinely available through commercial labs and is valuable when dealing with an outbreak situation.
- Cases and ill contacts of shigellosis patients should be excluded from foodhandling, the care of children or patients, and other occupations that pose significant risk of transmission until diarrhea ceases and 2 successive negative stool cultures are obtained 24 hours apart. Specimens should be obtained no sooner than 48 hours following last dose of antibiotics.(1)
- The search for unrecognized mild cases and convalescent carriers among case contacts may be unproductive in sporadic cases and seldom contributes to the control of an outbreak. Cultures of contacts should generally be confined to people employed in occupations likely to expose a large number of people, and other situations where the spread of infection is particularly likely.

Foodhandlers:

- When a foodhandler is diagnosed with *Shigella*, contact the Regional Communicable Disease Coordinator and the appropriate Environmental Public Health Specialist *immediately*.
- Cases with known (culture confirmed) *Shigella* infections or ill (symptomatic with diarrhea) contacts of shigellosis patients, should not be employed to handle food until 2 successive fecal samples are negative for *Shigella*. Specimens should be collected at least 24 hours apart, but no sooner than 48 hours following last dose of antibiotics.(1)

Child Care:

- Educating child care attendants and the children on the importance of frequent handwashing is key to preventing shigellosis.
- Because this infection is transmitted so easily and can be severe, all symptomatic persons, employees and children with Shigella infection should be excluded from the daycare setting until diarrhea has ceased and 2 stool cultures are negative for the organism. Specimens should be collected 24 hours apart and no sooner than 48 hours after the last dose of antibiotics.
- When shigellosis is identified in a child care attendee or staff member, stool specimens from other symptomatic attendees, staff members, and household contacts should be cultured.
- When two or more symptomatic cases of *Shigella* are identified in children or employees of a child care facility, contact the Regional Communicable Disease Coordinator <hyperlinks> *immediately.*
- Contact the Bureau of Child Care for the Environmental Public Health Specialist to perform an assessment of the child care facility.

Among the most difficult *Shigella* outbreaks to control are those involving groups of young children, especially those who are not yet toilet trained. To prevent spread of the infection, efforts should be made to prevent the transfer of children to other child care centers. Closure of affected child care centers may lead to placement of infected children in other centers (with subsequent transmission in those centers) and is generally counterproductive. If several persons are infected, a cohort system should be considered until two consecutive stool cultures collected at least 24 hours apart are negative.[(4)] Contact the Regional Communicable Disease Coordinator for assistance in establishing and monitoring a cohort system.

Laboratory Procedures

Specimens:

Collect specimens in Cary-Blair media using the Enteric Specimen collection kit supplied by the SPHL. Specimens should be shipped refrigerated.

Identification of *Shigella* requires collection of a fecal specimen as early in the course of the illness as possible and before antibiotic therapy begins.

Blood specimens and rectal swab specimens are not acceptable specimens for analysis by the SPHL.

Reporting Requirements

Shigella infection is a category II reportable disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services (DHSS)

within 3 days of first knowledge or suspicion by telephone, facsimile or other rapid communication.

1. For confirmed and probable cases, complete a "Disease Case Report" (CD-1), and a "Record of Investigation of Enteric Infection" (CD-2C) revised 6/02.
2. Entry of the completed CD-1 into the MOHSIS database negates the need for the paper CD-1 to be forwarded to the Regional Health Office.
3. Send the completed secondary investigation form to the Regional Health Office.
4. All outbreaks or "suspected" outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the Regional Communicable Disease Coordinator. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51).
5. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the Regional Communicable Disease Coordinator.

References

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2. American Academy of Pediatrics. "Shigella Infections." In: Pickering, LK, ed. 2000 Red Book: Report of the Committee on Infectious Diseases. 25th ed. Elk Grove Village, IL. 2000: 510-512.
3. Centers for Disease Control. Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR 1997; 46 (RR-10):31
4. Missouri Department of Health and Senior Services, Bureau of Child Care, Licensing Rules for Group Child Care Homes and Child Care Centers, 2002, 10-24.

Other Sources of Information

1. Dupont, Herbert L. "Shigella Species (Bacillary Dysentery)" Eds. Gerald L. Mandell, John E. Bennett, & Raphael Dolin, Principles and Practice of Infectious Diseases, 5th ed. New York: Churchill Livingstone, 2000: 2363-2368.
2. Donowitz, Leigh G., Infection Control in the Child Care Center and Preschool, 4th ed., Baltimore, MD, Williams & Wilkins, 1999: 271-273.

Websites

1. Centers for Disease Control and Prevention, Health Information, "Shigellosis" Frequently Asked Questions.
   http://www.cdc.gov/ncidod/dbmd/diseaseinfo/shigellosis_g.htm
   (29 May 2003)

2. U.S. Food & Drug Administration, Center for Food Safety & Applied Nutrition, "Foodborne Pathogenic Microorganisms and Natural Toxins Handbook", Bad Bug Book, *Shigella* spp. http://vm.cfsan.fda.gov/~MOW/chap19.html (29 May 2003)
3. Texas Department of Health. "Children's Hand Washing Helps Control Spread of Diseases at Day Care Centers"; TDH Accent on Health, 02/13/98. www.tdh.state.tx.us/news/acc0213.htm (29 May 2003)
4. Nelson P. Moyer, Ph.D. "The Elusive Epidemiology of Shigellosis," Hygienic Laboratory, The University of Iowa, Hotline Mar96-Shigellosis, Vol. 34, No. 9, pp.1-3. http://www.uhl.uiowa.edu/Publications/Hotline/1996_03/shigellosis.html (29 May 2003)

Shigellosis
FACT SHEET

What is shigellosis?
Shigellosis is an infectious disease caused by a group of bacteria called *Shigella*. Most who are infected with *Shigella* develop diarrhea, fever, and stomach cramps starting a day or two after they are exposed to the bacterium. The diarrhea is often bloody. Shigellosis usually resolves in 5 to 7 days. In some persons, especially young children and the elderly, the diarrhea can be so severe that the patient needs to be hospitalized. A severe infection with high fever may also be associated with seizures in children less than 2 years old. Some persons who are infected may have no symptoms at all, but may still pass the *Shigella* bacteria to others.

What sort of germ is *Shigella*?
The *Shigella* germ is actually a family of bacteria that can cause diarrhea in humans. They are microscopic living creatures that pass from person to person. *Shigella* was discovered over 100 years ago by a Japanese scientist named Shiga, for whom they are named. There are several different kinds of *Shigella* bacteria: *Shigella sonnei*, also known as "group D" *Shigella*, accounts for over two-thirds of the shigellosis in the United States. A second type, *Shigella flexneri*, or "group B" *Shigella*, accounts for almost all of the rest. Other types of *Shigella* are rare in this country, though they continue to be important causes of disease in the developing world. One type found in the developing world, *Shigella dysenteriae* type 1, causes deadly epidemics there.

How can *Shigella* infections be diagnosed?
Many different kinds of diseases can cause diarrhea and bloody diarrhea, and the treatment depends on which germ is causing the diarrhea. Determining that *Shigella* is the cause of the illness depends on laboratory tests that identify *Shigella* in the stools or rectal swabs containing stool of an infected person. These tests are sometimes not performed unless the laboratory is instructed specifically to look for the organism. The laboratory can also do special tests to tell which type of *Shigella* the person has and which antibiotics, if any, would be best to treat it.

How can *Shigella* infections be treated?
Shigellosis can usually be treated with antibiotics. The antibiotics commonly used for treatment are ampicillin, trimethoprim/sulfamethoxazole (also known as Bactrim® or Septra®), nalidixic acid, or ciprofloxacin. Ciprofloxacin and Ofloxacin are not recommended for use for persons younger than 18 years of age except in exceptional circumstances. Antimicrobial therapy should be administered for 5 days. Appropriate treatment kills the *Shigella* bacteria that might be present in the patient's stools, and shortens the illness. Unfortunately, some *Shigella* bacteria have become resistant to antibiotics and using antibiotics to treat shigellosis can actually make the germs more resistant in the future. Persons with mild infections will usually recover quickly without antibiotic treatment. Therefore, when many persons in a community are affected by shigellosis, antibiotics are sometimes used selectively to treat only the more severe cases. Antidiarrheal agents such as loperamide (Imodium®) or diphenoxylate with atropine (Lomotil®) are likely to make the illness worse and should be avoided.

Are there long-term consequences to a *Shigella* infection?

Persons with diarrhea usually recover completely, although it may be several months before their bowel habits are entirely normal. About 3% of persons who are infected with one type of Shigella, *Shigella flexneri*, will later develop pains in their joints, irritation of the eyes, and painful urination. This is called Reiter's syndrome. It can last for months or years, and can lead to chronic arthritis, which is difficult to treat. Reiter's syndrome is caused by a reaction to *Shigella* infection that happens only in people who are genetically predisposed to it.

Once someone has had shigellosis, they are not likely to get infected with that specific type again for at least several years. However, they can still get infected with other types of *Shigella*.

How do people catch *Shigella*?

The *Shigella* bacteria pass from one infected person to the next. *Shigella* are present in the diarrheal stools of infected persons while they are sick and for a week or two afterwards. Most *Shigella* infections are the result of the bacterium passing from stools or soiled fingers of one person to the mouth of another person. This happens when basic hygiene and handwashing habits are inadequate. It is particularly likely to occur among toddlers who are not fully toilet-trained. Family members and playmates of such children are at high risk of becoming infected. Incubation period varies from 1 to 7 days, usually 2 to 4 days.

Shigella infections may be acquired from eating contaminated food. Contaminated food may look and smell normal. Food may become contaminated by infected food handlers who forget to wash their hands with soap after using the bathroom. Vegetables can become contaminated if they are harvested from a field with sewage in it. Flies can breed in infected feces and then contaminate food. *Shigella* infections can also be acquired by drinking or swimming in contaminated water. Water may become contaminated if sewage runs into it, or if someone with shigellosis swims in it. Anal intercourse is another mode of transmission.

What can a person do to prevent this illness?

There is no vaccine to prevent shigellosis. However, the spread of *Shigella* from an infected person to other persons can be stopped by frequent and careful handwashing with soap. Frequent and careful handwashing is important among all age groups. Frequent, supervised handwashing of all children should be followed in day care centers and in homes with children who are not completely toilet-trained (including children in diapers). When possible, young children with a *Shigella* infection who are still in diapers should not be in contact with uninfected children. People who have shigellosis should not prepare food or pour water for others until they have been shown to no longer be carrying the *Shigella* bacterium.

If a child in diapers has shigellosis, everyone who changes the child's diapers should be sure the diapers are disposed of properly in a closed-lid garbage can, and should wash his or her hands carefully with soap and warm water immediately after changing the diapers. After use, the diaper changing area should be wiped down with a disinfectant such as household bleach, Lysol® or bactericidal wipes.

Basic food safety precautions and regular drinking water treatment prevents shigellosis. At swimming beaches, having enough bathrooms near the swimming area helps keep the water from becoming contaminated.

Simple precautions taken while traveling to the developing world can prevent getting shigellosis. Drinks only treated or boiled water, and eat only cooked hot foods or fruits you peel yourself. The same precautions prevent traveler's diarrhea in general.

How common is shigellosis?

Every year, about 18,000 cases of shigellosis are reported in the United States. Because many milder cases are not diagnosed or reported, the actual number of infections may be twenty times greater. Shigellosis is particularly common and causes recurrent problems in settings where hygiene is poor and can sometimes sweep through entire communities. Shigellosis is more common in summer than winter. Children, especially toddlers aged 2 to 4, are the most likely to get shigellosis. Many cases are related to the spread of illness in child-care settings, and many more are the result of the spread of the illness in families with small children.

In the developing world, shigellosis is far more common and is present in most communities most of the time.

What else can be done to prevent shigellosis?

It is important for the public health department to know about cases of shigellosis. It is important for clinical laboratories to send isolates of *Shigella* to the City, County or State Public Health Laboratory so the specific type can be determined and compared to other *Shigella*. If many cases occur at the same time, it may mean that a restaurant, food or water supply has a problem, which needs correction by the public health department. If a number of cases occur in a day-care center, the public health department may need to coordinate efforts to improve handwashing among the staff, children, and their families. When a community-wide outbreak occurs, a community-wide approach to promote handwashing and basic hygiene among children can stop the outbreak. Improvements in hygiene for vegetables and fruit picking and packing may prevent shigellosis caused by contaminated produce.

Some prevention steps occur everyday, without you thinking about it. Making municipal water supplies safe and treating sewage are highly effective prevention measures that have been in place for many years.

What is the government doing about shigellosis?

The Centers for Disease Control and Prevention (CDC) monitors the frequency of *Shigella* infections in the country, and assists local and state health departments to investigate outbreaks, determine means of transmission and devise control measures. CDC also conducts research to better understand how to identify and treat shigellosis. The Food and Drug Administration inspects imported foods, and promotes better food preparation techniques in restaurants and food processing plants. The Environmental Protection Agency regulates and monitors the safety of our drinking water supplies. The government has also maintained active research into the development of a *Shigella* vaccine.

How can I learn more about this and other public health problems?

You can discuss any medical concerns you may have with your doctor or other heath care provider. Your local city or county health department can provide more information about this and other public health problems that are occurring in your area. General information about the public health of the nation is published every week in the "Morbidity and Mortality Weekly Report", by the CDC in Atlanta, GA. Epidemiologists in your local and State Health Departments are tracking a number of important public health problems, investigating special problems that arise, and helping to prevent them from occurring in the first place, or from spreading if they do occur.

Some tips for preventing the spread of shigellosis:

Wash hands with soap carefully and frequently, especially after going to the bathroom, after changing diapers, and before preparing foods or beverages
Dispose of soiled diapers properly
Disinfect diaper changing areas after using them
Keep children with diarrhea out of child care settings
Supervise handwashing of toddlers and small children after they use the toilet
Persons with diarrheal illness should not prepare food for others
If you are traveling to the developing world, "boil it, cook it, peel it, or forget it"
avoid drinking pool water. For more information on this visit:
http://www.cdc.gov/ncidod/dpd/highlight2/index.htm (25 July 2003)

This Fact Sheet was developed from information provided by:
The Division of Bacterial and Mycotic Diseases
National Center for Infectious Diseases
Centers for Disease Control and Prevention
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Atlanta, Georgia 30333

Missouri Department of Health and Senior Services
Section for Communicable Disease Prevention
Phone: (866) 628-9891 or (573) 751-6113

SAMPLE LETTER TO PARENTS OF CHILDREN
EXPOSED TO SHIGELLOSIS

DATE

To Parents of Children at
_____
Child Care Center

Dear Parent:

A child who attends the _____ child care center has been diagnosed with shigellosis, a disease caused by the *Shigella* bacteria. The symptoms of shigellosis may include diarrhea, abdominal cramping, fever, nausea, and vomiting. *Shigella* is spread through contact with the stool of infected persons.

Children or any members of your household who develop any of these symptoms should be tested for shigellosis by having a stool specimen examination. This can be done through your local health department. [Stool specimen kits may be picked up and returned to the day-care center. We will make arrangements for them to be delivered to the health department.] If anyone in your household tests positive for shigellosis, your physician may want to prescribe medication. Please do not send children to the center if they have diarrhea.

An information sheet on shigellosis is enclosed. If you have questions please contact your physician or the _____ County Health Department at [phone number].

Sincerely,

MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES
SECTION OF COMMUNICABLE DISEASE CONTROL AND VETERINARY PUBLIC HEALTH

RECORD OF INVESTIGATION OF ENTERIC ILLNESS

MOHSIS CID#

Information with shaded titles is not required if entered on the CD-1 report or entered into MOHSIS.

NAME: (LAST, FIRST, MI)	DATE OF BIRTH: / /	AGE:	GENDER:	RACE:

PARENT(S) NAME IF NOT ADULT:	PHONE NO.:

HOME ADDRESS:	CITY:	STATE:	ZIP CODE:	COUNTY:

EMPLOYMENT / CHILD CARE (*See reverse side for High-Risk Employment information.)

PLACE OF EMPLOYMENT:	ADDRESS:	PHONE NO.:

OCCUPATION:	JOB DUTIES:

SCHOOL / CHILD CARE ATTENDED:	GRADE OR ROOM:

SCHOOL / CHILD CARE ADDRESS:	CITY:	STATE:	ZIP CODE:

Symptoms:* (Check Yes or No and number the order in which symptoms first presented)

ORDER NO.	SYMPTOM	YES	NO	ORDER NO.	SYMPTOM	YES	NO	ORDER NO.	SYMPTOM	YES	NO
	Nausea	☐	☐		Bloody Diarrhea	☐	☐		Malaise	☐	☐
	Vomiting	☐	☐		Cramps	☐	☐		Headache	☐	☐
	Diarrhea	☐	☐		Chills	☐	☐		Dizziness	☐	☐
	Watery Diarrhea	☐	☐		Fever_____°	☐	☐		Other		

Disease

DIAGNOSIS:	ONSET DATE / TIME:* / / _____ ☐ am ☐ pm	DURATION OF SYMPTOMS: _____ hrs.

INCUBATION PERIOD:*	PHYSICIAN CONSULTED? ☐ Yes ☐ No	DATE: / /	HOSPITALIZED? ☐ Yes ☐ No

PROVIDER NAME:	CITY:	STATE:	PHONE NO.:

TREATMENT: (TYPE, AMOUNT)	DATE:* / /

☐ Recovered ☐ Died	DATE OF DEATH: / /	CAUSE OF DEATH:

Patient History (Limit patient responses to within one disease incubation period.)

TRAVEL: (OUTSIDE OF HOME COMMUNITY) ☐ Yes ☐ No	DATE(S):*	LOCATION(S):

HOME WATER SUPPLY:

☐ Private (type)_____ ☐ Bottled Water (brand) _____

☐ Public Water District (Name)_____ Other water sources: _____

HOME SEWAGE DISPOSAL SYSTEM:

☐ Private (type)_____ ☐ Community System (Name) _____

RECREATIONAL WATER CONTACT: (SWIMMING POOL, LAKE, RIVER, ETC.)

☐ Yes ☐ No Type: _____ Location:_____ Dates:* _____

PET / ANIMAL EXPOSURE: (DOMESTIC PETS, LIVESTOCK, OTHER)

☐ Yes ☐ No Pets/Animals ill: ☐ Yes ☐ No Animal Type(s):_____ Date(s)* of Animal Exposure: _____

Describe Animal Exposure: _____

Location of Animal Exposure:_____

Comments:_____

Food**

	NAME	STREET ADDRESS	CITY / STATE
Grocery stores routinely used:			
Restaurants routinely used:			

OTHER FOOD SOURCES: (e.g., ETHNIC, UNPASTEURIZED, HOME CANNED)	TYPE / LOCATION:

* Epi Calendar (reverse side) may be used to help determine time periods.
** Attach separate 3-day food history if multiple cases are known/suspected.

Please submit this form along with completed CD-1 Report on all enteric cases.

Laboratory Tests*: Record Diagnostic Information in Section 41 of CD-1 Report and/or attach copy of lab slip(s)

Are there other associated cases? ☐ Yes ☐ No	If yes, how many?	How Associated:

List ill contacts:

NAME & ADDRESS	DOB / AGE	SEX	RELATION TO PATIENT	SIMILAR ILLNESS YES	SIMILAR ILLNESS NO	ONSET DATE	LAB CONFIRMED YES	LAB CONFIRMED NO	CD-1 AND ENTERIC FORM COMPLETED YES	CD-1 AND ENTERIC FORM COMPLETED NO
				☐	☐		☐	☐	☐	☐
				☐	☐		☐	☐	☐	☐
				☐	☐		☐	☐	☐	☐
				☐	☐		☐	☐	☐	☐

High Risk Employment Information (e.g., Food Handler, Child Care or Health Care Worker)

SPECIFIC JOB DUTIES:*

DATE(S) WORKED PRIOR TO ONSET OF ILLNESS:*	EXCLUDED FROM WORK? ☐ Yes ☐ No	DATE:* / /

IF YES, BY WHOM:	TITLE:

FOLLOW-UP SPECIMEN(S) REQUIRED? ☐ Yes ☐ No	DATE COLLECTED:* / /	RESULTS:* 1. _____ 2. _____ 3. _____

LAB:	WERE CONTROL MEASURES DISCUSSED WITH PATIENT? ☐ Yes ☐ No	BY:

RETURNED TO WORK? ☐ Yes ☐ No	DATE:* / /	EXPECTED DATE:* / /	EXCLUDED FROM HIGH-RISK DUTIES? ☐ Yes ☐ No

SEXUAL PREFERENCE: ☐ Heterosexual ☐ Homosexual ☐ Bisexual ☐ Unknown ☐ N/A	MULTIPLE PARTNERS? ☐ Yes ☐ No
RECREATIONAL DRUG USE: ☐ Yes ☐ No	DRUGS OF CHOICE:

*Epi Calendar:

MONTH(S) / DATES:	YEAR:	DISEASE:	WORK:

Sunday ____	Monday ____	Tuesday____	Wednesday____	Thursday ____	Friday ____	Saturday ____
Sunday ____	**Monday ____**	**Tuesday____**	**Wednesday____**	**Thursday ____**	**Friday ____**	**Saturday ____**
Sunday ____	**Monday ____**	**Tuesday____**	**Wednesday____**	**Thursday ____**	**Friday ____**	**Saturday ____**

OTHER PERTINENT EPIDEMIOLOGICAL DATA (TO INCLUDE PROBABLE SOURCE):

_____

_____

INVESTIGATOR:	DATE COMPLETED: